

George R. Brown Convention Center was full of NASA exhibitors at last week's science teachers convention. Photos on Page 3.



Special hours for viewing Mission Control and eating in the cafeterias have been set. Story on Page 4.

# Space News Roundup

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## Shuttle 10th anniversary celebration expands

By Kelly Humphries

Past and present Space Shuttle Program officials will travel back in time April 15, recalling their thoughts and feelings about the first shuttle flight in a round-table discussion.

JSC Director Aaron Cohen will host the round-table from 1-3 p.m. in Teague Auditorium, just before the 10th anniversary crew return celebration at the Gilruth Center.

The lineup of participants, representing their functions from that time, is expected to include John Yardley, then associate administrator for space flight; Bob Thompson, then shuttle program manager; Aaron Cohen, then orbiter project manager; Christopher Kraft, then

JSC director; STS-1 crew members John Young and Bob Crippen; and STS-2 backup crew and STS-1 crew members Joe Engle and Richard Truly.

JSC Public Affairs Director Harold Stall will be master of ceremonies.

Each panel member will be asked to spend five to 10 minutes recalling the events leading up to STS-1, sharing their personal highlights of the flight and giving their perspective 10 years later. If time permits, the



panel will field questions from the audience.

"I expect these remarks will provoke some lively discussions and anecdotes," Cohen wrote in his invitation. "It will be a good time to renew old friendships and to reminisce over events that have sped by at an incredible rate for all of us."

Preparations for the 10th anniversary crew return celebration are moving right along. The celebration will be from 4:30-8:30 p.m. April 15 on the south

parking lot of the Gilruth Center.

April 10 will be the last day to buy tickets. Tickets are on sale at the NASA/JSC Exchange Store in Bldg. 11 for \$3 each. Tickets also will be sold in the lobbies of Bldgs. 1, 30 and 45 from 11 a.m.-1 p.m. April 8-10.

A special anniversary issue of the Space News Roundup will be distributed with the April 12 paper.

The four-page section will include an in-depth look at the shuttle's first decade, an interview with the STS-1 crew, a look at the future of the shuttle program, and a chart that compiles statistics from the first 38 shuttle missions.

## NASA extends STSOC pact through 2000

By Pam Alloway

NASA has extended its contract with Rockwell Space Operations Co. to provide uninterrupted performance of the Space Transportation System Operations Contract through Dec. 31, 2000.

The total estimated value of the STSOC contract extension is \$2.3 billion. Total contract value, including all modifications, is \$4.8 billion.

The agreement will extend the length of the contract, one of the largest aerospace contracts of its type ever, to 15 years. It was first signed Sept. 12, 1985.

STSOC is a management-oriented contract covering administration and about 4,600 people. Rockwell is responsible for space shuttle project management, maintenance and operations, sustaining engineering, flight preparation and production and direct mission operations, testing and support.

The cost-plus-award fee contract includes the maintenance and operations of shuttle facilities including, but not limited to, the Mission Control Center, crew trainers and simulators, flight design and crew activity planning systems, the Shuttle Avionics Integration Laboratory, and the shuttle-related portion of the Central Computing Facility.

The contract also covers flight preparation activities, including flight planning and data generation, orbiter software reconfiguration, simulation preparations, and facilities reconfiguration. Direct mission support, through simulations and flight, and sustaining engineering support are included in the contract.

RSOC is based in Houston and the work covered in the contract is performed at JSC and RSOC's building on Gemini.



JSC Photo by Jack Jacob

**FIRST FLOAT**—The astronaut class of '90 takes one of its first zero-gravity familiarization flights in the KC-135. Counterclockwise from left are Rich Clifford (head down), Jeff Wisoff, Rick Searfoss, Nancy Sherlock, Tom Jones, Terry Wilcutt, Charlie Precourt, Janice Voss and Bill Gregory. In the center is Jim Halsell. The plane simulates zero-gravity for 20 to 30 seconds at a time by flying parabolic curves resembling a roller-coaster ride.

## Atlantis set to blast off early today

By James Hartsfield

The countdown for *Atlantis*' scheduled launch this morning on shuttle mission STS-37 had proceeded without a hitch as of Thursday, and weather had joined in the good news with a forecast that improved through the week.

If launched today, the crew of *Atlantis*—Commander Steve Nagel, Pilot Ken Cameron and Mission Specialists Jerry Ross, Jay Apt and Linda Godwin—will deploy the Gamma Ray Observatory about midday Sunday. Apt and Ross will exit *Atlantis*' airlock early Monday morning to perform the first American spacewalk in more than five years if all goes well. Saturday will be spent giving a thorough health check to GRO and the space suits.

An on-time launch at 8:18 a.m. CST will put *Atlantis*' landing at Edwards Air Force Base, Calif., about 9:30 a.m. CDT on Wednesday.

The crew arrived at Kennedy Space Center to make final preparations for the launch on Tuesday afternoon. The weather forecast, which earlier in the week had

Please see ATLANTIS, Page 4



## Galileo in safing mode; problem not serious

Flight controllers at NASA's Jet Propulsion Laboratory are working to return Galileo to normal operations after the spacecraft unexpectedly went into safing mode last week.

Although controllers do not know what caused the incident, it is not expected to have any permanent effect on the Jupiter-bound Galileo, which has been on a relatively quiet cruise en route to a flyby of the asteroid Gaspra next October.

Project engineers said they suspect the spacecraft's defensive

status was caused by cosmic rays.

Galileo, 36 million miles from Earth, went into the safing mode about 8:10 a.m. CST March 26. In safing mode, the spacecraft turned off science instruments and went into an "all-spin" configuration in which all parts of the spacecraft spin. Galileo had been in a "dual-spin" configuration, in which part spins and part remains fixed.

The spacecraft carried out a Sun-pointing maneuver to orient itself properly as part of the safing

response, and dropped the speed of the digital data it sends to Earth from 40 to 10 bits per second.

According to the flight team, data from Galileo show the incident occurred when one of the spacecraft's two redundant command and data computers detected a problem and took itself off-line. The other computer continued to function properly. The cause of the computer problem is unknown, but appears to have been a transient signal of some kind. There is no evidence of any

permanent damage.

Project officials plan to reconfigure Galileo and resume normal activities by April 25. Project officials said next Wednesday's main antenna unfurling will be delayed, but will be carried out before the April 25 uplink of the next major command sequence.

This is the second time Galileo has entered safing mode since launch from the Space Shuttle *Atlantis* in October 1989. In both cases, the spacecraft responded exactly as intended, project officials noted.

## Senior managers commit to total quality

Blueprints drawn for all-out drive to improve performance

By Kelly Humphries

JSC's senior management team has drawn up the blueprints for the center's Total Quality Management structure and will move aggressively to begin construction in the coming months.

The decisions were made during a March 19-20 retreat that focused on how to improve JSC's performance through the application of Total Quality principles, processes and techniques at all levels.

Convinced that Total Quality must start with top management, JSC's directors and program managers

organized themselves as the Senior Quality Board and expanded the Total Quality Steering Committee to include representatives from all organizations.

JSC Director Aaron Cohen and his top staffers also decided that immediate improvements are possible in some areas and began the process of choosing candidates for improvement. As implementation plans are developed, critical process teams will be formed to investigate and improve each of these processes.

Within the next few months,

employees at all levels of selected directorates will begin seeing the shift to the Total Quality philosophy. The effects of the shift will broaden as the effort matures.

Associate Director Dan Nebrig, who will chair the Total Quality Steering Committee, said areas that have been identified as needing attention include continuous shuttle efficiency improvement, orbiter processing time, in-house flight hardware development, systems acquisition and the budget process. "Our growing workload, precise

Please see TOTAL, on Page 4



JSC Photo by Bob Walck

The Cumberland Group's John Newcaster discusses goals at a recent Total Quality retreat with top JSC managers. In the foreground, from left, are JSC Deputy Director Paul J. Weitz, Director Aaron Cohen and Associate Director Dan Nebrig.

JSC

# Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m. to 2 p.m. weekdays.

General Cinema (valid for one year): \$4.  
 AMC Theater (valid until May 1992): \$3.75.  
 Loews Theater (valid for one year, can be used two weeks after premiere): \$4.  
 Astroworld (valid 1991 season): season, \$44.94; child less 4-feet, \$10.12; one day, \$15.85; Waterworld, \$8.13.  
 Seaworld of Texas (valid 1991 season): child (3-11), \$12.25; adults, \$17.25.  
 Deep sea fishing (7:30 a.m.-7:30 p.m. April 13, includes bait, tackle and crew): \$45 to fish; \$20 to ride.  
 NASA Night at Astroworld (6 p.m. April 5, park closed to public): \$8 for first 5,000; \$10 for next 5,000.  
 Galveston Historical Homes Tour (May 4, 5, 11 or 12): \$11.  
 STS-1 10th anniversary (4:30-8:30 p.m. April 15, Gilruth): \$3. Tickets also available from 11 a.m.-1 p.m. April 8-10 in lobbies of Bldgs. 1, 30 and 45.

JSC

# Gilruth Center News

**EAA badges**—Dependents and spouses may apply for a photo I.D. 6:30-9 p.m. Monday-Friday. Cost is \$5.

**Defensive driving**—Course is offered from 8 a.m.-5 p.m., June 15, July 13 and Aug. 10. Cost is \$15.

**Aerobic dance**—Eight-week session meets 5:15-6:15 p.m. Tuesday and Thursday. Cost is \$24.

**Exercise class**—Class meets 5:15-6:15 p.m. Monday and Wednesday. Cost is \$24.

**Weight safety**—Required course for employees wishing to use the Gilruth weight room. The next classes will be from 8-9:30 p.m. April 10 and April 25. Cost is \$4.

**Country and western dance**—Beginning and intermediate classes begin April 22. Beginner class meets from 7-8:30 p.m. Monday; intermediate class meets from 8:30-10 p.m. Mondays. Cost is \$20 per couple.

**Fiction workshop**—Classroom sessions meet for five weeks from 6:30-8 p.m. Wednesdays beginning April 3. After class readings will be from 8-10 p.m. Cost is \$80.

**Aikido**—Martial arts class meets from 6:30-7:30 p.m. Tuesdays for six weeks began April 2. Cost is \$30.

**Ballroom dance**—Ballroom dancing instruction will be offered in eight-week session beginning May 2. Cost is \$60 per couple.

**Scuba**—Four-week course meets from 6:30-9:30 p.m. Thursdays, beginning April 4. Cost is \$50 plus additional fees.

**Tennis**—Beginning tennis lessons, offered for six weeks began March 25. Cost is \$32 per person.

**Almost Anything Goes**—Six teams needed for JSC Picnic competition. Cost is \$10 per six-person team. Registration deadline is 7 p.m. April 25.

JSC

# Swap Shop

**Property**  
 Rent Lake Livingston, waterfront, 3-2, CA/H, furn, cov decks, pier, ex cond, wknd/wkly, 482-1582.  
 Rent League City, Pecan Forest, 3-2-2, FPL, nice house, \$795/mo. 554-6200.  
 Lease: Galveston condo, 2-1, all appli, FPL, covered parking, \$525/mo. 289-6777.  
 Sale: Lake Livingston, West Side Mid-Lake, 81'x140', trees, water, electr, low taxes and maint, \$1850, 488-5445.  
 Sale: League City, Meadowbend, 3-2-2, ex cond, pool, deck \$73K assum. John Gillman, 280-7461 or 538-2072.  
 Sale: Clear Lake, 2-story condo, 1-1.5-CP, patio, balcony, all appli, FPL, \$38K assum. 486-0508.  
 Sale: Bay Glen, 3 BR, study, marble and ceramic floors, mid \$120s. 486-3977.  
 Sale: Pirates Beach townhouse, 2-1.5 lot, furn, \$625K. Jeff, 280-3909.  
 Sale/Lease: Waterfront complex, 2-1 condo, ceiling fans, FPL, w/w water bed, sofa and table, all amenities: 326-2221 or 280-5801.  
 Sale: Middlebrook, 3-2-2, cul de sac, new paint, carpet, and ceramic tile, new AC in '89, \$89K. 538-1051.  
 Sale: Bayou Vista lot, good bulk head, on west bay, \$950. 339-1957.  
 Rent: Friendswood area, enclosed RV storage stall, 40' deep, lights/pwr, reasonable rate. 482-9396.  
 Sale: Dickinson, 75 Supreme Chalet mobile home, 2-1.5, 12' x 60', \$7K, owner fin avail. x33139 or 534-2288.  
 Lease: Condo, 2-1.5, new paint/carpet and blinds, all appli, \$475/mo plus dep. Lori, x34718 or 554-2601.  
 Sale: Pearlard lot, for medium density houses, Dixie Hollow Subdivision, Cyprus Hollow St, all util. x39530 or 482-5003.  
 Sale: Two water view lots near NASA, \$38.5K ea; backyard lot on Todville \$125K. Don, x38039.  
 Rent: Galveston condo, furn, sleeps six, Seawall Blvd and 61st St, wknd/dly/wkly rates. Magdi Yassa, x33479 or 486-0788.  
 Sale: Baciff, 3-2-2 detached 2-story house, fenced corner lot, den, CA/H, appli, \$53K. 559-1341.

**Cars & Trucks**  
 '89 Ford Ranger XLT, fully loaded, tow pkg, 20K mi, \$6800, OBO. Kay x45161 or 486-6177.  
 '81 Datsun King cab, w/toolbox, good work truck, \$750. Jimmie, 333-2009.  
 '84 Ford Van XLT club wagon, loaded ex cond, new tires, 75K mi, \$6400, 482-1582.  
 '80 Pontiac Phoenix V6, auto, stereo, 5-door hatchback, good cond, \$1950. x30092 or 481-3637.  
 '86 Nissan 300 ZX, maroon, fully loaded, T-tops, ex cond, \$6975. 488-4373.  
 '78 Malibu Classic Chevrolet, exterior needs paint, ex cond interior, \$500. 282-4168 or 992-5441.  
 '79 Dodge Omni, manual trans, new brakes/clutch, AM/FM/cassette, new inspection/license plate, \$800. 481-9523.  
 '82 Ford Anaheim Custom van, pwr str/brakes, AM/FM, 4 capt chairs, sofa/bed, BO. 488-3191.  
 '89 Mercury Tracer, 5 spd, A/C, AM/FM/cass, 1.6L eng, \$6600 or take over pmts, \$199/mo. 554-6583.  
 '89 Ford Econoline van, 36K mi, Tra-Tech diamond edition, 6 cyl, ex cond, \$12,800. (409) 925-4743.  
 '82 4WD Jeep Eagle wagon limited, 6 cyl, auto, pwr win/locks, 75K mi, \$3000 OBO. x34213 or 286-7149.  
 '81 Lincoln, 2 dr T/C, ex cond, maroon, \$4800. 332-7383.  
 '83 Ford Country Squire wagon good cond, BO. Dan, 481-3056.  
 '73 GMC Sierra 3/4 ton truck, good cond, 454 eng, AC, camper, \$1200. Floyd, x37467 or 486-4043.  
 '87 Ford Tempo GL, black/red interior, 4 dr sedan, 75K mi, ex cond, \$4000, 538-1051.  
 '77 Monte Carlo, 350 V8, 115K, AC, AM/FM/cass, new tires/trans w/1 yr warr, runs great, \$1500 OBO. Mark, x37491 or 333-1494.  
 '84 Chevrolet Silverado Suburban, clean nine passenger, AC/dual heaters, trailer towing pkg, \$5300. 480-1624.  
 '77 Pontiac Grand Prix, sun roof, P/S, P/W, \$1500, '82 Ford van, ex cond, 56K mi, \$5000, x36604 or 482-7156.  
 '85 Plymouth Reliant, good cond, 4 dr, auto, A/C, P/S, P/B, 4 cyl, \$2600 OBO. '81 Toyota Tercel, fair cond, 4 dr, 5 spd, P/S, P/B, A/C, needs front shocks, \$1400 OBO. James, x31765 or 339-2198.  
 '88 Dodge Grand Caravan SE, 7 pass, V6, auto, P/S, P/B, dual air/heat, rear wipers, 2 capt chairs, AM/FM, \$11,850. 326-1775.  
 '82 Chrysler LeBaron, good cond, \$1800. Manuel, x38326.  
 '83 Monte Carlo, \$3500 OBO. '84 Mustang \$3500, OBO. Gretchen 2883-0446 or 482-8744.  
 '79 Ford Fairmont, really rusty, runs great, \$600 OBO. 471-2885.

'86 Buick Regal LTD, V8, 2 dr, all pwr, ex cond, 70K mi, \$4800 OBO. 282-4041 or 337-2318.  
 '86 Toyota 4x4 P/U, ex cond, lots of extra, \$7500 OBO. 992-3447.  
 '87 Toyota Supra, ex cond, white/maroon int, \$9000. Gary, x37898 or 333-2751.  
 '80 Audi 5000 Diesel, 5 spd, AC, Blaupunkt radio, \$1200 OBO. 326-4684.  
 '87 Toyota Corolla FX16, red, 53K mi, 4 cyl, 5 spd, PS/PB, A/C, tint cloth int, cruise, AM/FM/cass, ex cond, \$5600. x31698 or 480-2467.  
 '83 Porsche 928S, 57K mi, auto, sun roof, loaded, ex cond, \$15K. Gloria 480-0235 or 485-7555.  
 '89 Buick Regal GS, V6, AT, PS, A/C, sun roof, AM/FM/cass, all pwr, cruise, 16K mi, \$10K. 538-1107 or 280-2592.  
 '82 Pontiac Bonneville wagon, ex cond, all pwr, cruise, tilt, AM/FM/cass, V8, A/C, \$1500 OBO. Glenn, x38067 or 484-4709.  
 '90 Camaro RS, red, V8, AT, A/C, code alarm, bra, T-tops, ex cond, 15K mi, \$11,750. 283-1285 or 538-1078.  
 '88 Mazda 323 SE, 47K mi, A/C, AM/FM/cass, sun roof, new tires, \$4300. x31027 or 332-8743.  
 '84 VW Rabbit, needs engine, all else good cond, BO. 283-35843.  
 '77 Dodge Monaco, A/C, new brakes, reliable, \$700 OBO. Gene, x38020 or 334-1505.  
 For parts: '82 Chev S10, V6 engine; '74 Chev 1 ton truck w/good 350 eng; '79 Ford F250 w/good 400V eng. Datson 2602; Chev S10 V6 eng block. 332-1811.  
 '90 Chrysler LeBaron GT convertible, loaded, leather int, alarm, 9K mi, in warr, red w/grey top, was \$20K plus, now \$15,900. Pat, x32661 or 485-5636.  
 '73 Dodge Challenger, auto, PS, PB, new tires and front end, good working cond, \$850. Kyle, 481-2195.

**Cycles**  
 Raleigh 19" bicycle. Beatrice, 335-1862.  
 Two 20" Robo freestyle bicycles, \$60 ea. Kay, 486-6177.  
 '80 Honda 750 CB, good cond, 26K mi, \$600. 337-1896.  
 '79 Harley-Davidson sportster, 1000cc, \$2100 OBO; '74 Honda CB 750, \$300 OBO; '74 Honda, 100cc, \$50 OBO. James, x31765 or 339-2198.  
 CB 1000 frame w/tanks, front & rear wheels, \$150, asstid parts. Jeff, x32578 or 488-2543.  
 Lady's 3 spd Vista bicycle, \$100. 283-5465.  
 Girl's bike, ex cond, \$25. 335-4204 or 286-1212.  
 Mountain Bike, 18 spd, Shimano components, index shifting, 19" chromoly frame w/dbl wide tube const, alum wheels, sealed hubs, U brakes, quick release seat, bike release front wheel, ex cond, \$200 OBO; deluxe baby bike seat w/helmet, \$50 OBO. x31094 or 286-8545.

**Boats & Planes**  
 J24 sailboat, 24', Great One design racer/cruiser, new 8 hp OB, 3 sets of sails, main, 150 genoa, jib, spinnaker, trk, \$9500 OBO. Glen, 280-8644 or 282-3699.  
 '70 Coronado 25, new main sail w/cover, 2 jibs, depth sounder, compass, 7.5 hp OB w/controls, good cond, \$5500. John, x30217 or 484-0395.  
 '17 Ouachita alum canoe, \$400. 474-4663.  
 '87 19' Bass Cat Pantera, fully equip, 200 hp Suz, ex cond, 332-7383.  
 '19 Crestline boat IB/OB 165 hp, 862-3929.  
 Seda Dart kayak w/spk spray skirt and old paddle, \$200; Ouachita alum 16' canoe, good cond, \$250. Craig, x36206.  
 Fiberglass V hull 12'Jon boat, \$200; 5 hp OB tuned, new prop, \$200. 339-1957.  
 O'Brien 5.4 meter, single batten sail in good cond, \$30 OBO. x38311.  
 '79 Renegade 1540 ski boat, 140 hp Evinrude, sst prop, custom trf, new seats, carpet, paint, ign sys, \$2500 OBO. 333-6868 or 486-7846.  
 '89 Sea Bay 160 Bow Rider, 100 hp Merc, galv trf, ss prop, Bimini top, cover, stereo, \$8800. Ron, 280-2543 or 482-0927.  
 21' V hull IB/OB, 260 hp Merc, new paint, tandem axle trf, \$3600, will finance w/ 1/3 dwn. 326-4681.  
 '83 Renken 18' sailboat, roller furling jib, 4 hp aux, galv trf, sleeps 4, good cond, \$4000. 339-3476.

**Audiovisual & Computers**  
 SPF 880 El Gar battery backup for computers, rating 550 VA, ex cond, \$300. Jimmie, 333-2009.  
 AT&T monochrome monitor, ex cond, \$20. Bill, x38574.  
 IBM XT 640K computer, 30 MB HD, color monitor, \$950. x30092 or 481-3637.  
 Mitsubishi, MGA, stereo sys, int amp, tuner, pair of speakers, sys in ex cond, speakers in fair cond. \$275.  
 Pair of Advent Prodigy tower speakers, 75W, \$275; pair

JSC

## Today

**Cafeteria menu**—Special: barbecue link. Entrees: deviled crabs, broiled codfish, liver and onions. Soup: seafood gumbo. Vegetables: buttered corn, green beans, new potatoes.

## Monday

**Lockheed NMA meets**—The Lockheed National Management Association will present a brown bag luncheon at 11:40 a.m. April 8 in the Lockheed Plaza 4, Rm. 44F. "Why the Japanese Have Been So Successful" will be the topic. For more information contact Charles Campbell at 333-6107.

**Cafeteria menu**—Special: chili and macaroni. Entrees: barbecue sliced beef, parmesan steak, spare rib with kraut. Soup: French onion. Vegetables: ranch beans, English peas, mustard greens.

## Tuesday

**USSF symposium**—The United States Space Foundation will host its Seventh National Space Symposium April 9-12 at the Broadmoor Hotel, Colorado Springs. For more information call (719) 550-1000.

**Cafeteria menu**—Special: corned beef hash. Entrees: meatballs and spaghetti, liver and onions, baked ham with sauce. Soup: split pea. Vegetables: buttered cabbage, cream style corn, whipped potatoes.

## Wednesday

**Windows showcase**—The Information Systems Directorate will host a "Microsoft Windows Showcase"

from 9 a.m.-3 p.m. April 10-11 at the Product Demonstration Facility, Bldg. 12, Rm. 112. For more information, call the PDF at x37589.

**Astronomy seminar**—The JSC Astronomy Seminar will hold an open discussion meeting at noon April 10 in Bldg. 31, Rm. 129. For more information contact Al Jackson, 333-7679.

**Cafeteria menu**—Special: barbecue link. Entrees: cheese enchiladas, roast pork and dressing. Soup: seafood gumbo. Vegetables: pinto beans, Spanish rice, turnip greens.

## Thursday

**NPMA dinner meeting**—The JSC National Property Management Association will meet at 5 p.m. April 11 at the Gilruth Center. Coleman S. Moore, president of the Clear Lake City Chamber of Commerce, will speak. For more information contact Sandra Pierce 282-4151.

**Cafeteria menu**—Special: chicken fried steak. Entrees: roast beef with dressing, fried perch, chopped sirloin. Soup: beef and barley. Vegetables: whipped potatoes, peas and carrots, buttered squash.

## April 12

**Cafeteria menu**—Special: fried chicken. Entrees: fried shrimp, baked fish, beef stroganoff. Soup: seafood gumbo. Vegetables: okra and tomatoes, buttered broccoli, carrots in cream sauce.

## April 15

**STS-1 anniversary**—JSC will mark the 10th anniversary of the first

space shuttle mission with a crew return celebration from 4:30-8:30 p.m. at the Gilruth Center. Tickets are \$3 and are on sale at the JSC Exchange Store. Tickets also will be available from 11 a.m.-1 p.m. April 8-10 in the lobbies of Bldgs. 1, 30 and 45. Call Ginger Gibson at x30596 or Cyndi Draughon at x30494 for more information.

**Lockheed NMA meets**—The Lockheed National Management Association will present a brown bag luncheon at 11:40 a.m. April 15 in the Lockheed Plaza 4, Rm. 44F. "Present Economic Problems" will be the topic. For more information contact Charles Campbell at 333-6107.

## April 17

**JSC seminar**—The JSC Astronomy Seminar will be at noon April 17 in Bldg. 31, Rm. 129. Astronaut Jeff Hoffman will discuss the results of the Astro-1 mission. For more information contact Al Jackson, 333-7679.

## April 20

**Spring Star Party**—The JSC Astronomical Society and Challenger-7 Memorial Park will host public telescope viewing of the stars and planets of spring from dusk to 9:30 p.m. April 20. Call Bill Williams at x33849 or 339-1367 for more information.

## April 21

**Spring concert**—The Bay Area Chorus will present a spring concert at 3 p.m. April 21 at United Methodist Church of Pasadena. Tickets are available by calling 684-6030.

of Advent Baby II speakers, 50W, \$175. 996-1382.  
 PC AT-286 computer, 1 MB RAM, 12 MB floppy, 40 MB HD, VGA monitor, \$950. Wayne, 282-3261.  
 AT&T 6300 computer, 640K RAM, 30 MB hard card, 2 360K FD, game port, game card, 8087 coprocessor, color graphics monitor, \$700. Keith, x38024 or 554-4309.  
 AT&T 6300 computer w/RGB monitor, 2 FD, 640K, Panasonic printer, modem and SW, \$800. Ron, x30887 or 334-7530.  
 Realistic Micro-27 microcassette recorder, 2 spd capstan drive, voice actuated, fast playback, 7 blank tapes, \$58; B&K mod 290 electronic multimeter, PR-21 probe, manual, \$150. Tom Clark, x49842.  
 Foxtex reverb sound effects unit, stereo I/O, \$100. Brad, x37653.  
 640K IBM compatible, all books/boxes, 150 floppies w/ SW, 20MB HD, 360K FD, Herc mono graphics 8087 coprocessor, \$500, 200W pwr supply, \$40, ext 5.25 case, \$5, 3.5 to 5.25 adaptor, \$5; VGA board, \$12K 1024 x 768, \$75. Jeff, x32578 or 488-2543.  
 Color video camera, sound, zoom, manual focus, w/pwr supply, \$150. Bill x39020 or 991-0361.  
 128K Apple IIe, 80 col card w/cmp, dual disk drives, SW, was \$1695, now \$695. Liem, 282-3841 or 484-3211.  
 Two printers, Star SG-10 and Cannon wide carriage, \$60 ea, cable incl; 2-way Motorola low band, 100W ea, both units w/wires, speakers, microphones head pieces and antennas, \$250 for both. Howard, 282-3841 or 482-3985.  
 Peavey 6 channel XR-600B mixer amp w/two Peavey 112 wdb cabinet speakers, \$700 OBO. 484-7583.  
 Cerwin-Vega HED-15 high effc speakers, 100W, \$250 OBO. Steve, 282-4108 or 333-3176.  
 Pair of Advent Prodigy tower speakers, 75W, \$275.  
 TI 99-4A computer, ex cond, manuals, SW, joy sticks, ex cond, \$125. Tim, x32519 or 488-6227.  
 Sony AM/FM/CD car stereo, Harmon Kardin graphic eq, Sanyo 100W amp, Eddie, x34580.  
 Borland Turbo Pascal for Windows, new unopened, was \$175, now \$125. x32071 or 980-9230.  
 Brother HR-15XL Daisy wheel printer, ex cond, \$50. x38039.  
 C++ compiler, Borland C++ Professional for Windows, new unopened, \$250. x32960.

## Musical Instruments

Tascam home recording studio, Tascam 8 track recorder, Tascam 30 mixer, plus 4 DBX 15's, \$3500; rack stand, \$75; Fender Telecaster Sunburst guitar w/case, American made, \$325. Ron, 474-3612.  
 Ludwig snare drum, was \$500, now \$300. 998-7260 or 471-3218.  
 Selmer tenor sax, \$750. x37435 or 280-8249.  
 Spencer student's flute w/case, used one yr, \$100. Bob, x32193 or 326-3984.  
 Alvarez-Yairi guitar, 60th anniv mod, blk/brn sunburst, gold hardware, abalone trim, hardshell case, \$700. Brad, x37653.

## Pets & Livestock

Himalayan cat, net regis; green haired tabby, both neutered, free. Sam, x37967 or 332-8222.  
 Rabbits, mini-lops and New Zealand. Gailo, 554-6200.  
 Bobwhite quail, chicks to maturity. Ken, 388-1504.  
 Yr old regis blk, male, trained, good w/children, \$150. 474-9435.  
 5 yr old sorrel gelding, \$700. 554-6138.  
 Pigeons for hunting, \$6.50 ea. Liem, 484-3211.  
 AKC toy/teacup poodle, fem, 8 wks old, shots, blk/white, \$250. Cindy, 282-3960 or 333-4907.  
 Hand fed blue and gold macaw w/cage, \$1200; noble macaw w/cage, tame, \$500; bear-eyed cockatoo, talks, tame, w/cage, \$550; blue front Amazon parrot w/cage, \$550, 1 pr Gloster canaries, sings, w/cage, \$200; 5 yr old, chocolate par Himalayan, declawed, neutered, shots, \$100. Donna, 283-5453 or 337-3838.  
 AKC long hair chihuahua, male, red fawn w/bk markings, weight approx 3.5 to 4 lbs, 2 yrs old, shots, \$250. 534-3893.

## Photographic

Movie/slide screen, rollup w/tripod, \$10. Samouce, x35053 or 482-0702.  
**Household**  
 Heavy workbench, 26" x 72" w/vice, \$30. Samouce, x35053 or 482-0702.  
 25" color TV console, \$150; 2 glass top end tables, \$60 ea; glass top coffee table, \$75; beige couch, \$75; stereo cabinet, \$75. 482-7607.  
 Loveseat and chair, silver w/brn and blk flowers, \$175 OBO; DR table w/4 chairs, \$125. 337-1896.

Sears 30 gal energy saver water heater, ex cond, \$45; Sears 30" range hood/light, new, green, \$20. Bill, x38574.  
 Various sud and color miniblinds, ex cond, \$9 ea; Ig Amana Spacessaver microwave oven, needs repair, BO; Ig chair, \$10. Edward, x36250.  
 Princess girl's BR set, white/gold, 2 canopy beds, 2 night stands, dresser, vanity, desk, bookcase/hutch, mirror and vanity chair, no matt, good cond, \$300. 534-3893.  
 Queen sz waterbed, 488-3191.  
 Couch, loveseat, chair, ottoman, 10 throw pillows, lg matching picture, floral-dark blue w/white and rust, lg and comfortable. \$350. Nora, 333-1328.  
 Brass hat and coat rack, antique style, was \$180, now \$90. Bob, 484-0898.  
 Chair, leather look naugahyde, orange, swivel, barrel back, ex cond, \$85. 474-5610.  
 King sz wtrbd, dark pine, padded rails, liner, matt, heater, pad, ex cond, was \$390, now \$250, entertainment center, was \$90, now \$50. Ted, 282-2808 or 488-6352 or Alison, x34314 or 326-2156.  
 Sears Best king sz matt and springs, \$200. 486-8266.  
 New carpet, grey, brown/gold, fawn, pink, never used, various dimensions, \$80/all or will sell separate, 32 to 50 oz weight. 339-1337.  
 Frigidaire dishwasher, gold, good cond, \$60. 488-6310.  
 Matching loveseat and recliner, couch, oak entertainment center, coffee table, TV stand; butcher block table w/bench and chairs; Snapper riding mower w/access, \$1200; metal storage bld, 10' x 12', \$700; microwave, \$80; dorm sz refrig, \$80. Keith, 332-0048.  
 Queen sz wtrbd, semi motionless, padded rails, matt pad, new heater, \$160. Howard, 282-3841 or 482-3985.  
 193 cu ft, heavy duty commercial freezer, white, ex cond, manual defrost, \$400 OBO. 486-7017.  
 Rollaway bed, 3/4 sz, \$50. x36080 or 482-5621.  
 Two leather sided glass top coffee tables, \$50 ea; two 15" wire wheel covers, \$25 ea. James, 335-6710 or 482-6744.  
 Sofa, ex cond, \$200; coffee table, 2 matching end tables, \$175; 22 cu ft almond refrig w/icemaker, 4 yrs old, \$350. 333-6277 or 339-3562.  
 Child Craft oak contemporary baby bed, \$150; Kenmore 15 cu ft upright freezer, \$200; bantwood rocker, \$30; stereo receiver w/speakers, \$25. 480-3325.  
 DR table w/2 leaves, 8 chairs, hand carved mahogany, unfinished, \$875. x33182 or 486-2622.  
 King sz wtrbd, ex cond, med pine finish, lighted bookcase headboard, dresser w/hutch, two bedside tables, storage drwr base, dual semi-motionless matt w/dual heaters, \$500. 471-4100.  
 2 dr refrig, G.E. elec 30" stove, blk dr w/microwave on top, apt washer, full sz W/D, used dishwasher, BO. 332-1811.  
 Heavy duty Imperial commercial upright freezer, 2 yrs, 193 cu ft, ex cond, was \$1200, now \$700. x35495.  
 Flattan loveseat, swivel chair, two glass top lamp tables and footstools, \$220 OBO. x31094 or 286-8545.

## Wanted

Want sliding glass door and/or windows. Bill, x39230.  
 Want riders for vanpool from SW Side and Braeswood-610 to CLC/JSC, \$65/mo. Keith, x30222 or 879-0903.  
 Need vanpool riders from Sugar Land, Westwood Mall, Fondren and 610 Park & Ride to JSC area. Alice, x35234.  
 Need to buy used encyclopedias. 940-5005.  
 Want woodworking tools, especially table saw, bandsaw and router. Greg, 283-1273 or 554-2504.  
 Need volunteers for literacy tutors in Pearland-Sagemont area. Mon and Wed, a few hrs after work. Neil, x33715.  
 Want non-smoking roommate for 1 rm in Webster 3 BR, pet OK, \$250 plus 1/3 util. Ken, x34368 or 280-0802.  
 Want used Eclipse 88 Wimbledon tennis racquet, graphite/fiberglass composite. x30874 or 333-1316.  
 Want Fisher-Price car seat. Gretchen, 283-0446 or 482-6744.  
 Want Lark, Rascal or other model elec drive cart. 944-5615.  
 Want lawn mower and edger in good cond, utility trf, 4' x 8' or sm boat trf. x38311.  
 Want roommate to share CL Bayglen, 3-2-5-2 w/sunroom, \$300/mo plus 1/2 util. 282-3215 or 480-9448.  
 Want baby jogging stroller, prel w/sunshade. Rick, x38088 or 480-0443.

## Miscellaneous

Takachiko AT-500, telephone answering sys w/auto paging, announcement tape, message, beepers/remote, 2 mo old, \$150; Bunde clarinet w/case, ex cond, \$150; International couch w/loveseat and ottoman, couch and chair,

man's western boots, antique gateleg table. Ether, x36148.  
 Sears roasting machine, \$75; GYMPAC weight machine, w/bench, \$100. 482-7607.  
 Baby jogger w/canopy and basket, ex cond, \$200. 286-5106.  
 New bridal attire, wedding gown sz 4, veil, 2 pc under attire, \$800 or will sell sep; man's wedding ring, yellow gold w/ 5 sm diamonds, sz 9, new. 455-3463.  
 Sears Lifestyler cross country skier/rower, ex cond, \$175. Brent, x36456 or 486-0389.  
 Fiberglass camper shell fits std Toyota PU, pass thru window, new gas window shocks, ex cond, \$450 OBO. Kevin, x33571 or 996-5061.  
 Sears eng analyzer, tach, dwell, volts, amps, 4, 6 or 8 cyl, was \$100, now \$25. 334-2963.  
 Lady's bowling ball, bag and sz 6 shoes, \$25. 332-1725 or 283-5465.  
 Disney baby nursery items, bottles; man's and lady's bicycle; rattan swivel rocker; 11 to bowling ball and bag. Lisa, 474-7234.  
 White satin wedding gown, sz 6, fitted, low V back, long sleeves, \$300. Marla, 334-7530.  
 Drafting table w/side bar, 24" x 36", storage cabinet underneath, \$40. 474-4663.  
 Wood shed, 48" x 8'8", int floor, composition roof, white, good cond, \$75. 330-1337.  
 Quartz elec heater, \$20; Kenmore upright vac, \$40; wedding dress w/veil, \$100; 3 Chevy 4X4 16" rims, one w/ 12



# Sharing Science

NASA and JSC were big players in last week's National Science Teachers Association convention at George R. Brown Convention Center in Houston, taking up about a fourth of the display space with 65 booths and 36 major exhibits.

Clockwise from above:

1) With more than 15,000 science teachers at the convention, the NASA exhibits stayed busy.

2) Teachers weren't the only people who enjoyed the exhibits. Brian Ellis of Slidell, La., does his short-armed best to try out a space suit glove box with the help of his mother, Elaine.

3) Bonnie Neff of Nevi, Mo., right, and Margaret Sanstrom of Lake Charles, La., second from right, demand more space tomato seeds from Dr. Jim Alston, who helps NASA with the SEEDS educational project.

4) Leila Dumas of Austin tries out the Direct Link Prehensor robotic hand as Larry Li of JSC's Automation and Robotics Division explains how it works.

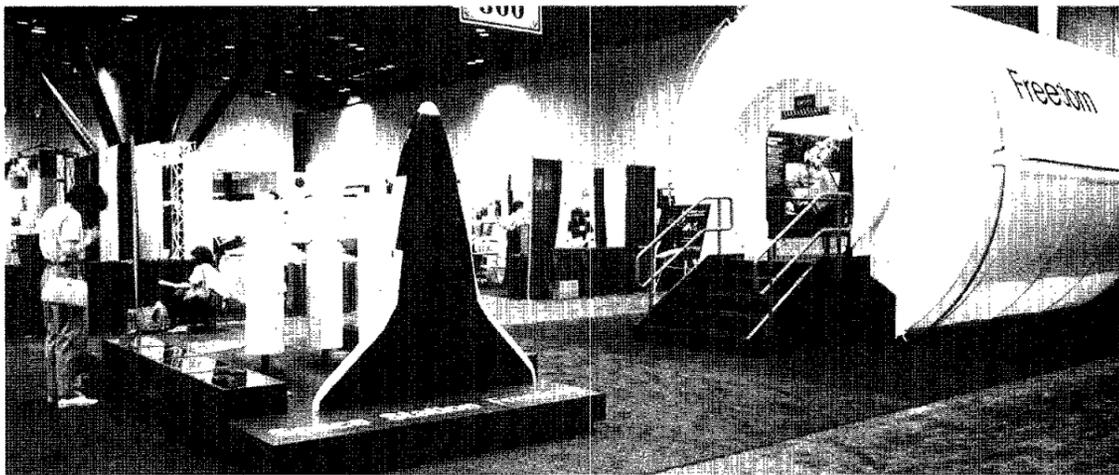
5) Sarah Ellis, Brian's sister, confronts an extravehicular mobility unit space suit.

6) Chuck Lloyd of JSC's Medical Operations Branch discusses biotechnology with an unidentified teacher.

7) NASA's display included mock-ups and models of the space shuttle and Space Station *Freedom*.

8) Astronaut Bob Cabana, left, discusses the new "Space Basics" educational videotape with Robert Baker, a biology professor at Bemidji (Minn.) State University.

9) Tommie Walton of JSC's Public Services Branch reduces the size of the piles of printed materials handed out to teachers like Shari Siefert of Cincinnati.



JSC Photos  
by  
Robert Markowitz  
and  
Mark Sowa

# Venus hot spots may be venting interior heat

The planet Venus may be venting interior heat through giant hot spots called coronae, a form of volcanism, a Magellan scientist reported this week at NASA's Jet Propulsion Laboratory.

"Coronae may be hot spots, the surface expression of hot material rising from the interior of the planet," said Dr. Ellen Stofan, a geologist on the Magellan project.

She said coronae are among the several types of circular features

associated with volcanism that have been identified on Venus. Others include large volcanoes and spider web-shaped features called arachnoids.

Coronae are circular or oval by a ring of ridges and troughs. They range in size from about 100 miles to more than 600 miles in diameter and are seen in many low-lying plains regions on Venus.

Arachnoids are circular volcanic structures surrounded by complex

fractures. They may form by volcanism in a region where the surface is pulling apart or extending, Stofan said.

"Coronae, arachnoids and volcanoes are ways in which Venus transfers heat from its interior out to the surface," she said. "On Earth, this loss or transfer of heat is dominated by plate tectonics. It is too early to determine if Venus also has plate tectonics, but hot spots do seem to be important to Venus' heat loss.

"High-resolution Magellan data have revealed many exciting new aspects of coronae," she said. The Magellan spacecraft has mapped with imaging radar more than 67 percent of Venus since last Sept. 15. The first 243-day mapping cycle ends May 15.

Project management also announced that the first CD-ROM, or read only-memory, containing Magellan mosaics of radar images was released to the National Space

Science Data Center (NSSDC) for public distribution. One CD-ROM can hold about 600 megabytes of information or about 270,000 pages of text. The information can be easily accessed with a computer using a CD-ROM reader similar to audio CD-players.

Magellan CD-ROMs containing 10 Magellan mosaics each, or 560 individual images, are produced by JPL and Dr. Raymond Arvidson of Washington University, St. Louis.



JSC Photo by Mark Sowa

**SCENT OF SPRING**—Katie Kumpf, a recent visitor to JSC from Alcron, N.Y., sniffs the tulips in the breezeway outside Bldg. 2.

## Atlantis launch set for today

(Continued from Page 1)

predicted a 50-50 chance of launching Friday, improved by Thursday to give *Atlantis* a 60 percent chance of launching on time and an 80 percent chance of launching later Friday morning.

The STS-37 launch countdown began at 4:30 a.m. CST Tuesday, and the service structure was rolled away from *Atlantis* late Thursday morning. Liquid hydrogen and liquid oxygen propellants were to be pumped into *Atlantis*' external fuel tank starting about midnight.

Just up the coast at KSC's neighboring launch pad, *Discovery* is in place for a launch possibly as early as late this month. *Discovery*, with repaired and strengthened external tank umbilical door closing mechanisms installed, was rolled out to Pad 39A on Saturday.

The Air Force Program-675 (AFP-675) and the Infrared Background Signature Survey mounted on the Shuttle Pallet Satellite-II (IBSS-SPAS II) were reinstalled in *Discovery*'s cargo bay Wednesday. Hypergolic fuels, chemicals that ignite when they contact

each other, are to be loaded into *Discovery*'s orbital propulsion systems late this week.

*Columbia* remains in Bay 1 of Kennedy's processing hangar being prepared for a late May launch on Spacelab Life Sciences-1. The Spacelab module has been installed in *Columbia*'s payload bay. Also, strengthened fuel tank door closing mechanisms have been installed. Tests of the environmental control system and the orbital propulsion systems were scheduled for late this week, as well as installation of the galley.

## Vehicle passes exhausted for two flights

All of the vehicle passes to watch STS-37 or STS-39 launches and/or landings already have been distributed, but employees may request passes for other upcoming missions.

NASA, contractor and Air Force badged JSC employees are issued passes on a first-come, first-served basis.

A pass permits the occupants of one standard-sized passenger vehicle,

including vans, to view a launch or landing from a specific site. Special passes usually are available for larger vehicles.

Requests for future launches and landings should be submitted in writing to: Vehicle Pass Request, AP4. The request should include name, telephone extension, complete mailing address, whether you want a launch and/or landing pass, a specific shuttle

flight number, and whether your vehicle is a standard (which includes vans) or oversized vehicle.

For shuttle dates, consult a current manifest. Instructions will be provided along with the vehicle pass which is mailed to the requester about three weeks before launch. Requests received fewer than 30 days before a specific flight are placed on a waiting list.

## Total Quality plan being designed

(Continued from Page 1)

quality needs and complex program requirements are forcing us to make significant improvements in the way we work," Nebrig said.

"World-class American companies have responded well to similar challenges and have made order-of-magnitude improvements simultaneously in higher quality, lower costs and on-time delivery," he added. "They have been using Total Quality to focus on the customer and make continuous improvement everyone's responsibility. To be a world-class organization in the '90s, we will need to build on their successes and seek out new concepts, tools and techniques to increase the quality of our processes, products and services."

The Senior Quality Board will conduct two-day retreats about once a month to deal with critical quality issues, the first of which will focus on

updating the center's Strategic Game Plan. The Total Quality Steering Committee, with its expanded membership, will meet every Monday to develop recommendations and set agendas for the SQB, and to fine-tune plans to implement Total Quality around the center.

Starting soon, all directorates, staff offices and program offices will begin holding two-day retreats to train the participants in Total Quality techniques and develop action plans for their individual organizations. About two retreats a month will be conducted, with all offices completing their meetings by the end of the year.

The Cumberland Group, a Cincinnati-based consulting consortium that acted as facilitator of the recent retreat, has been retained to provide the training for managers and employees. A substantial amount of time and effort will be invested in Total

Quality training, and the center's training priorities will be adjusted to support that investment.

As the directorates and offices begin to implement their action plans, they will form Quality-plus teams similar to the Total Quality Steering Committee but smaller in scope. These Quality-plus teams will be made up of a cross-section of employees in each organization.

NASA Administrator Richard Truly has announced he plans to use Total Quality to make NASA ready to compete for the President's Award for Quality and Productivity Improvement in 1992. Each center has been asked to do a self-assessment of where it stands in the implementation of Total Quality Management.

Beginning in June, NASA teams will validate these assessments with on-site visits and report back to Truly in the fall.

## Archers will take aim at world championship near JSC's Rocket Park

JSC will be the site of the 1991 World Target Archery Championship Trials in May.

Rick Stonebraker, tournament organizer, said the trials will be held May 8-12 just north of Rocket Park. About 100 competitors are expected to participate.

The trials, sponsored by the Texas State Archery Association and the National Archery Association, will select a four-man, four-woman team to represent the United States in the world championship tournament in Krakow, Poland, this August.

Boyd Mounce, tournament liaison for JSC's Public Services Branch, said the trials are one of many community involvement projects JSC has elected to sponsor on site in an effort to be an accessible, cooperative neighbor within the community.

Archers will be scored on the basis of how close they come to the center of the target, which has five colors and 10 scoring rings, from various distances. Each competitor will shoot three arrows at a time within a two-and-a-half-minute time period. Scoring will take place after every six arrows at long

distances, and after every three arrows at shorter distances. Archers will shoot 36 arrows at each distance. Stonebraker said the official practice session will be from noon-6 p.m. May 8.

The first day of competition will be May 9, with shooting beginning at 10 a.m. Men will shoot from 90 meters and the women from 70 meters. Afternoon shooting will start at 2 p.m., with men shooting from 70 meters and women shooting from 60 meters.

The second day of shooting will start at 10 a.m., with men and women shooting at 50 meters. At 2 p.m., both groups will shoot from 30 meters.

The top 24 men and women after the first two days of competition will continue to shoot May 11-12 in the grand final elimination.

Stonebraker, an EBASCO quality engineer at JSC, said volunteers are needed, and encouraged them to call him at x33856 or 488-3527. Spectators are invited to attend the competition.

Stonebraker recently returned from the first Indoor World Archery Championship in Finland, where he represented the United States and placed 18th with his best score of the year.

## Mission Control viewing hours set for employees

The Mission Control Center viewing room will be open to JSC and contractor badged employees and their families during portions of the STS-37 mission.

Based on a Friday morning launch, employees will be allowed to visit the MCC from 1-5 p.m. Saturday, 1-5 p.m. Sunday, 5-7 p.m. Monday, and 11 a.m.-2 p.m. and 5-7 p.m. Tuesday. Monday's shortened viewing time is because of a planned extravehicular activity scheduled from about 7 a.m.-1 p.m.

Employees must wear their badges and escort family members through the regular public entrance on the northeast side of Bldg. 30. Visitors should limit their stays during busy periods. Children under the age of 5 will not be permitted in the viewing area.

The STS-37 crew return ceremony will be held at Hanger 990 at Ellington Field about 7 1/2 hours after the crew

lands at Edwards Air Force Base in California. Based on a planned 9:30 a.m. CDT Wednesday landing, the ceremony would begin about 5 p.m. Wednesday.

Since many variables are involved in mission operations, viewing and crew return times may change with little notice. Employees are encouraged to call the Employee Information Service at x36765 for the latest information.

Special cafeteria hours have been set for the mission, as well. The Bldg. 3 cafeteria will be open launch day from 7 a.m.-4:30 p.m. On Saturday and Sunday it will be open from 11 a.m.-4:30 p.m. and on weekdays during the mission from 7 a.m.-4:30 p.m. The Bldg. 11 cafeteria will be open launch day from 7 a.m.-2 p.m. On Saturday and Sunday it will be open from 7-10 a.m. and on weekdays during the mission from 7:30 a.m.-2 p.m.

## Seminar eyes dual role of many women

The Federal Women's Program will sponsor two seminar sessions on "The Dual Role of the Working Woman" next week.

The sessions will be from 8:30-11:30 a.m. and from 1:30-4:30 p.m. April 12 in the Gilruth Center ballroom.

The seminar will focus on the changing roles of women and men, emphasizing productive ways to deal with role conflicts.

On the agenda are social mores and value systems, sex stereotyping effects on career development, identifying androgynous behaviors, healthy adult characteristics, tips on lightening the load of high achievement, coping methods, and identifying and modifying unrealistic self expectations.

Registration will be on a first-come, first-served basis. All JSC employees and contractors are invited. For more information, call Freda Marks at x30603.

## Space News Roundup

The Roundup is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Texas, and is published every Friday by the Public Affairs Office for all space center employees.

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full-sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication.

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